EPA Responses to Comments from MWH Americas, Inc. on External Review Draft of the Phase II Sampling and Analysis Plan for Operable Unit 3, Libby Asbestos Superfund Site, Part A: Surface Water and Sediment, February 22, 2008

GLOBAL

Please make the name Mill Pond consistent throughout document. It is referred to as "the mill pond," "Mill pond" and "Mill Pond."

EPA Response: The text has been revised as suggested.

Please consider the use of "constituents" or "contaminants," not "chemicals of concern," "chemical contaminants," etc. (LA is not a chemical, but a group of amphibole minerals, each with different chemistries).

EPA Response: The text has been revised as suggested.

Please make "chain-of-custody" consistent throughout document.

EPA Response: The text has been revised as suggested.

TEXT

Table of Contents: The following acronyms do not appear in this document: OSHA, PPE, SPP, TRV and TWF. The acronym for "semi-volatile organic compound" is listed as "SVOP," and should be changed to "SVOC." The acronym "RPM" is defined as "Remedial Project *Manger*."

EPA Response: The text has been revised as suggested.

Section 1.1, page 1: In the second sentence of first paragraph please change the presuppositional "...lands that have been impacted..." to "...lands that **may** have been impacted..."

EPA Response: OU3 is defined in the Administrative Settlement Agreement and Order on Consent for Remedial Investigation/Feasibility Study (CERCLA 08-2007-0012) as the property in and around the Zonolite Mine and any area impacted by the release and subsequent migration of hazardous substances and/or pollutants or contaminants from the property. EPA makes a distinction between OU3 (for which the exact geographic area will be defined based primarily on information obtained in the remedial investigation) and the preliminary study area for OU3 which includes lands that may have been impacted. The document has been revised in Sections 1.1 and 2.1 to reflect this distinction and to emphasize that the preliminary study area boundary of OU3 is not the same as the final boundary of OU3.

Section 1.2, page 2: Please correct the full name to "MWH Americas, Inc.," not "MWH Global, Inc." (This same comment was made in our review of the Phase I SAP and the correction was not made to the final document.)

EPA Response: The text has been revised as suggested.

Section 1.2, page 3: Please add "MWH Project Director: F. Michael DeDen" to the top of the list and change role for John D. Garr from "MWH Field Supervisor" to "MWH Project Manager."

EPA Response: The text has been revised as suggested.

Please add "U.S." to "Department of Transportation."

EPA Response: The text has been revised as suggested.

Section 2.1, page 4: First sentence of fourth paragraph is presuppositional; please change "...lands that have been impacted..." to "...lands that **may** have been impacted..."

EPA Response: The document has been revised in Sections 1.1 and 2.1 to emphasize that the preliminary study area boundary of OU3 is not the same as the final boundary of OU3. The definition of OU3 includes lands that have been impacted by releases from the mine site.

Section 2.2, page 5: Please remove "suitable." Simply stating the demonstrable fact that OU3 is "habitat" to a wide range of ecological receptors is sufficient and avoids questions as to the "suitability" of the habitat.

EPA Response: The text has been revised as suggested.

Section 2.3, page 5: Third paragraph contains a discussion on stream flow variation due to snowmelt for "several streams in the area," and refers to Figure 2-2, which shows hydrographs for four drainages described as "similar to Rainy Creek." Although the "similarities" are not described, it should be recognized that the four drainages for which hydrographs are provided are significantly different from the Rainy Creek drainage, in that they have predominantly north-to-northeast aspects and in every instance have higher minimum, maximum and average elevations (and, presumably, greater snowpack thicknesses). Most of the Rainy Creek drainage faces southwest; combined with its lower elevation, snowmelt at OU3 can be expected to begin, peak and conclude earlier than in the "similar" drainages.

EPA Response: The text has been revised to note this limitation.

The fourth paragraph of this section refers to "This variation..." and "...this interval." Please recast to clarify the intervals intended.

EPA Response: The text has been revised as suggested.

Section 3.1, page 6: Please correct the spelling to "Rainy" not "Rainey." In the same sentence, "major" is used to describe several ponds and impoundments that were sampled during Phase I, but it is unclear as to what distinguishes a "major pond." Please use more precise language, or remove "major."

EPA Response: The text has been revised as suggested.

Section 3.2, page 6: The wording "a broad suite of other chemicals" is so imprecise as to be meaningless; please provide the full list of analytes, or at least provide examples of the different classes of analytes, so the reader is not required to seek out the table.

EPA Response: The text has been revised as suggested.

Section 3.3, page 6: Please use uppercase "C" in the name Fleetwood Creek.

EPA Response: The text has been revised as suggested.

Section 3.4, page 7: In the third paragraph it is suggested that sediment in seeps "might be serving as sources of release" of LA. The water and sediment in seeps may receive LA through the weathering, erosion and transport of fibers from waste rock, tailings and bedrock outcrops on the mine site, but the seeps are not the "sources" of release. In the last sentence, use of the terms "widespread" and "substantial" is imprecise and meaningless.

EPA Response: The text has been revised to simply describe the results. The terms "widespread" and "substantial" have been deleted.

Section 3.5, page 7: Analytical results presented on Table 3-7 for surface water and sediment are vague. Please present these results more clearly, at least in a table showing the specific results detected and the reporting limits. What are the levels of concern for these detections? The usefulness of "Detection Frequency" and "Mean Detection Limit" is unclear. For example, it is neither surprising nor informative to see that surface water samples collected from OU3 contained detectable calcium in 24 of 24 samples (100%), or that iron was detected in 3 of 24 samples (13%). What is the utility of noting that "hardness" was measurable in every one of the surface water samples? Even the "Mean" and "Maximum" concentration columns are of little value if the data are not presented within some frame of reference, such as published regulatory limits.

The following is an excerpt from Guidance on Systematic Planning Using the Data Quality Objectives Process (EPA QA/G-4, February 2006) that discusses the importance of comparing analytical data to baseline conditions.

In certain instances, the baseline condition may be prescribed for you in regulations. For example, the baseline condition in RCRA facility ground water monitoring is that the

concentration is within background levels (i.e. the true parameter value is below the action level). In the absence of regulatory considerations, the planning team should define the baseline condition by evaluating the potential consequences of making decision errors based on the outcome of the statistical hypothesis test, and as a result, taking the wrong actions. For example, incorrectly accepting a baseline condition that remediation of a contaminated site is unnecessary could result in adverse health effects from the continued exposure, and a loss of integrity if the error is later discovered. In contrast, incorrectly concluding that this baseline condition be rejected could lead to unnecessary remediation costs and a diversion of resources from more urgent problem areas. You need to determine which of these two types of decision errors has the more severe consequences, especially when the true value of the parameter is near the Action Level. Finally, defining the baseline condition can be done, in part, based on prior knowledge. For example, you may have good cause to believe that the true value for the parameter is above some specified level, and therefore, you define the baseline condition to correspond to this situation and require your data to demonstrate otherwise.

To illustrate the importance of comparing the analytical results to baseline concentrations, while it is true that total extractable hydrocarbons were detected in 23 of 24 sediment samples collected during Phase I, only 12 of these samples exceeded the Montana DEQ Petroleum Release Section (MT DEQ PRS) screening-level concentration of 50 mg/kg. Of those samples that exceeded the screening level standard, analysis by Method 8270 revealed that only *one* of the samples contained detectable concentrations of only *one* PAH compound (pyrene, in sample "TP-TOE2"). The pyrene concentration in the sample was 0.0049 mg/kg; the EPA Region 9 Preliminary Remediation Goal (PRG) for pyrene in *residential* soil is 2,300 mg/kg. While it is conceded that Region 9 PRGs do not apply to OU3, such published standards are useful in providing at least *some* reference with which to compare and evaluate the concentrations of many contaminants of potential concern at OU3.

Similarly, total extractable hydrocarbons were detected in 2 of 24 surface water samples ("CCS-14" and FC Upper Pond") and both samples were above the MT DEQ PRS groundwater screening standard of 300 ug/L; however, analytical results for these samples were non-detect by Method SW8270C and the MA-EPH method. As noted in the Energy Laboratories case narrative for the "CCS-14" sample,

"There were no detectable Extractable Petroleum Hydrocarbons after EPH fractionation analysis of sample B07101319-009. The hydrocarbon profile from the EPH screen chromatogram indicated the slight amount of hydrocarbons measured in the screening analysis were late eluting, in the C28 to C36 boiling point range, did not resemble any petroleum hydrocarbon mixtures on file, and may have been due to naturally occurring organics."

The Energy Laboratories case narrative for the "FC Upper Pond" sample states,

"There were no detectable Extractable Petroleum Hydrocarbons after EPH fractionation analysis of sample B07101427-011. The hydrocarbon profiles from the EPH screen chromatograms were consistent with naturally occurring organics."

The case narratives for these samples were provided with analytical data packages issued by Energy Laboratories during the last week of November 2007. This very important and

valuable information has apparently not been used to focus or otherwise guide the Phase IIA scope of work, rather, the full analyte list has been carried over from Phase I.

EPA Response: The text has been revised to state explicitly why the Phase I data are not being evaluated by comparison to available reference values or guidelines, and that simple detection of a chemical should not be interpreted as evidence of a release or a concern. Also, EPA agrees that the information from the case narratives is important and this has been added to the text.

Section 3.6, page 8: As stated in this section, "*Table 3-8 summarizes the results for analytes detected in sediment samples analyzed as part of the Phase I investigation. As seen, a number of inorganic constituents were detected, as were several indicators of petroleum hydrocarbons. In addition, methyl acetate was detected in two samples and pyrene was detected in one sample. All other chemical analytes were never detected in any sample. ...the results for total extractable hydrocarbons in sediments...As seen, nearly all samples were above the detection limit.*"

Again, the results presented in Table 3-8 are vague, and the same comments given in response to Section 3.5 apply. What is the value in knowing that each sediment sample had measurable pH (mean 7.2; maximum 8)? Likewise, because the sediments at OU3 are derived primarily from naturally occurring aluminosilicate minerals, it is not at all surprising that they contain aluminum. To simply state that "as seen, nearly all samples were above the detection limit" is meaningless; absent a discussion of actual concentration values in the context of some type of concentration reference (e.g., a "baseline" concentration or published standards), such a statement is misleading and can be perceived as biased or alarmist.

Please provide further explanation of the results of the non-LA analyses performed. What are the levels of concern? Extractable hydrocarbons *were* detected in many of the sediment samples; however, the laboratory clearly stated in project narratives that the results did not represent a recognizable petroleum hydrocarbon pattern; this is the very type of information that was intended to be derived from the Phase I investigation.

EPA Response: The text has been revised to state explicitly why the Phase I data are not being evaluated by comparison to available reference values or guidelines, and that simple detection of a chemical should not be interpreted as evidence of a release or a concern. EPA has also added information on the number of samples that will be sufficient for comparison to reference values or guidelines. Finally, summary tables of non-asbestos results are included in electronic format to provide more information about the locations and results.

Section 4.2, page 9: In the first paragraph, second sentence, please remove "-related" from "site-**related** surface water features." In the same paragraph, incidental ingestion of surface water or sediment is suggested as a primary route of exposure for the "maximally exposed human receptor." It should be recognized that ingestion of LA has been described by EPA as a relatively minor exposure hazard, as compared to the inhalation

route, for humans at OU4 (the town of Libby). The language should be recast so as not to emphasize a risk to humans at OU3 that EPA has de-emphasized at OU4.

EPA Response: The text has been revised to explain why evaluation of oral exposure to LA is included in the evaluation of human receptors in OU3 but not in OU4.

Section 4.3.1, page 10: Please provide examples of the contaminants (and their concentrations) that have actually been detected at OU3 that may become of concern during snowmelt runoff or other periods of increased surface water flow. The assumption that increased stream flow rates will result in increased contaminant concentrations in site surface water and sediment is unsupported.

EPA Response: The text has been revised to make clear that it is unknown whether or not concentrations will change (increase) during spring runoff, and that the purpose of the investigation is to determine whether or not a change does occur in this interval, and if so, to characterize it.

Section 4.3.3, page 10: What would be considered "sufficient" data to eliminate an analytical class from continued consideration? The statement that "...asbestos contamination is wide-spread in both surface water and sediment..." is based on analytical results for samples collected from specifically-targeted, "worst-case" locations. The frequency of detection under a biased sampling scheme *does not* support the conclusion that a contaminant is "widespread." Such imprecise terms (other examples of "value statements" and vague terms in this document include, "substantial," "significant," "a number of") are inappropriate.

EPA Response: The process of eliminating chemicals or classes of chemicals of potential concern will be done in the human health and ecological risk assessments in accord with standard screening procedures applied at Superfund sites. The data from Phase I are not considered to be sufficiently robust to support implementation of this process until the data have been supplemented with data from Phase II to ensure adequate temporal representativeness. Note that sampling stations have been selected to provide good spatial coverage of the site, and it is not appropriate to categorize the majority of the stations as "worst case". Nor is it appropriate to characterize the sampling design as "biased". The detection of LA in nearly every sediment sample does support the conclusion that it is "widespread". Other "value statements" have been revised, as suggested.

Section 4.3.3, page 11: In the last sentence of the paragraph the text states, "...all of the analytes assessed in surface water and sediment during Phase I are retained for further evaluation in Phase IIA." What is the basis for assuming that sediment concentrations of LA, or other constituents, will vary seasonally? In general, sediment concentrations vary much less on a seasonal basis than surface water or groundwater concentrations. This point seems to be supported by text in the fourth paragraph which states, "...levels of LA in sediment are not expected to vary as widely with flow so sediment toxicity testing can be deferred for planning and implementation to Phase IIB."

EPA Response: The text notes that, although it is not necessarily expected that sediment concentrations will vary as widely as surface water, it is certainly plausible that levels will vary to some degree due to cycles of deposition and scouring, both of which are flow-dependent. Because no data are presently available to evaluate the magnitude of any such fluctuations, sediment sampling in Phase IIA is needed to determine the magnitude of this variation. Additionally, if it is ultimately determined that remedial actions are needed to address concerns over sediment contamination, these data will also serve as a baseline against which the effectiveness of any actions can be judged.

Section 4.3.3, page 11: In the first sentence of the third paragraph the text states that an important tool for evaluating risks to exposed receptors is to expose receptors (fish, benthic macroinvertebrates) to site media (surface water, sediment) in order to observe whether the media causes adverse effects in laboratory species. While we agree that such methods may provide value to understanding the potential for contaminant impacts on wild species, extrapolation of laboratory test results to receptors in the wild may be difficult due to site-specific variables not included in laboratory tests, and/or receptor adaptation to a stressor. Please keep in mind that the Libby Mine site has high naturally occurring levels of LA, and receptors inhabiting this area may have adapted mechanisms to deal with this natural constituent. Therefore, results of laboratory-based toxicity testing should not be the sole evidence when making risk management decisions regarding the Site. Instead, they should be included in a weight-of-evidence evaluation that includes observations on presence/absence and overall health of receptor populations within the area.

EPA Response: EPA agrees that there may be naturally occurring levels of LA in site waters and sediments (although this has not yet been established), and agrees that risk conclusions should be based on a weight of evidence approach.

Section 4.3.3, page 11: As discussed during the February 28, 2008 meeting in Salt Lake City, we agree that conducting site-specific toxicity testing on surface water during Phase II in spring 2008 will provide valuable information. We also concur that *sediment* toxicity testing can, and should be, deferred until the results of site-specific toxicity testing for surface water is completed.

The second paragraph under the *Site-Specific Toxicity Tests* subheading includes the statement, "With regard to surface water, because it is expected that the concentration of LA and any other site-related contaminants will be highest during spring runoff, collection and testing of water from this time interval is an essential element of the Phase IIA effort." No rationale, references, or examples are provided to support such an expectation; in the absence of such, the statement is presuppositional. While it is true that a single round of samples (such as those collected as part of Phase I) may not be representative of year-round conditions, it is quite possible that increased stream flow rates during the snowmelt period will actually *dilute* the concentration of LA (and other constituents) in surface water. It is unclear by what mechanism the concentrations of

"any other site-related contaminant" would be increased by increased surface water flows. Please provide the rationale that supports this "expectation."

EPA Response: The text has been revised to make clear that it is unknown whether or not concentrations will change (increase) during spring runoff, and that the purpose of the investigation is to determine whether or not a change does occur in this interval, and if so, to characterize it.

Section 4.3.3, page 11: Here again, in the first sentence under the subheading *Flow Data* the statement that "...concentrations of asbestos and other analytes in water (and possibly also in sediment) are anticipated to depend on flow..." is unsupported. As stated in this document, one of the purposes of the Phase IIA investigation is to evaluate the relationship between stream flow variation and contaminant concentrations. In the absence of supporting information, it is not appropriate to speculate or presuppose what that relationship is.

EPA Response: The text has been revised to make clear that it is unknown whether or not concentrations will change (increase) during spring runoff, and that the purpose of the investigation is to determine whether or not a change does occur in this interval, and if so, to characterize it.

Section 4.3.4, page 12: In the second sentence, please replace the letter "f" with the word "of."

EPA Response: The text has been revised as suggested.

Section 4.3.5, page 12:

Phase I (and now Phase IIA) data have been described as "not necessarily intended to support decision-making." It makes one wonder what *is* the purpose of Phase I and Phase IIA sampling? Although the Phase I data have not yet been completely validated, the Phase IIA SAP has been prepared, and it is not apparent that the results of Phase I have guided or even influenced the Phase IIA scope. For example, the Phase I analyte list has been carried over intact for Phase II, using the unknown influence of snowmelt runoff on contaminant concentrations as justification. It would be helpful if a discussion were provided somewhere in this document to explain the mechanisms by which specific analytes could have greater concentrations during periods of high surface water flow rates. The examples provided in the comments on Sections 3.5 and 3.6 demonstrate that important analytical results from Phase I have been ignored in scoping Phase IIA.

EPA Response: The DQO section has been revised to provide the decisions, the decision rules, and the tolerance for decision errors that apply to the Phase IIA program and describes how the Phase IIA sampling design is intended to support those DQOs.

Section 4.3.6, page 12: The following is an excerpt from EPA's Guidance on Systematic Planning Using the Data Quality Objectives Process (EPA QA/G-4, February 2006).

Step 6: Specify Performance or Acceptance Criteria.

The sixth step establishes acceptable quantitative criteria on the quality and quantity of the data to be collected, relative to the ultimate use of the data. These criteria are known as performance or acceptance criteria, or DQOs. For decision problems, the DQOs are typically expressed as tolerable limits on the probability or chance (risk) of the collected data leading you to making an erroneous decision. For estimation problems, the DQOs are typically expressed in terms of acceptable uncertainty (e.g., width of an uncertainty band or interval) associated with a point estimate at a desired level of statistical confidence.

What are the performance or acceptance criteria for Phase IIA data? Why is a description of the decision rules being deferred to the Phase IIB SAP? What will be known *then* that is not known *now*? To simply contend that no analysis of decision errors is needed because the data are not necessarily intended for decision-making is not in keeping with the DQO process. If the data will not be used for decision-making, for what *will* they be used?

EPA Response: The DQO section has been revised to provide the decisions, the decision rules, and the tolerance for decision errors that apply to the Phase IIA program and describes how the Phase IIA sampling design is intended to support those DQOs.

Section 5.0, page 13: Remedium Group and MWH recommend that one surface water sampling station be added to Element 1 of the sampling program, at the pond immediately upstream of the tailings impoundment boundary depicted on Figure 5-2. This portion of the tailings impoundment complex appears to be separated from the main body of the impoundment by a berm, and appears to be much deeper than the portion from which sample "TP" was collected during Phase I (and from which "TP" samples are to be collected during Phase IIA). This deeper water is assumed to not freeze through during winter or to fully evaporate and/or infiltrate during summer or in drought conditions, and may be more representative of aquatic habitat than the shallow main body of the tailings impoundment. Fish and other aquatic receptors, if present, are likely to primarily inhabit the deeper portion of the tailings impoundment. Surface water within the deeper portion of the tailings impoundment should be sampled to provide surface water concentrations of LA that fish or other aquatic receptors, if present, are most likely to encounter.

EPA Response: EPA agrees, and has proposed that both surface water and sediment be collected from this deeper pond (see Figures 5-1 and 5-2). In accord with the suggestion in this comment, the samples for water will include both a surface and a deep water depth-stratified sample, in order to determine if there is evidence of variation in the concentration of LA by depth.

Section 5.1.1, page 13: Please consider adding the word "constituent" or "contaminant" between "and" and "concentration" in the first sentence, and recasting the second sentence in this paragraph to clarify that *contaminant* concentrations, not *surface water* or *sediment* concentrations, will be measured. In the last sentence of this paragraph, please

replace the word "of" in "...risk **of** human and ecological receptors..." with the word "to."

EPA Response: The text has been revised as suggested.

Will sediment sampling be deferred to Phase IIB, as described in Section 4.3.3?

EPA Response: Yes. Details will be provided in a separate SAP.

Section 5.1.3, page 18: While Remedium Group and MWH recognize that the relationship between storm events and stream flow rates in the Rainy Creek drainage is unknown and probably complex, please provide the rationale for storm event sampling being triggered by a 20% increase in flow rate. Also, please provide additional guidance on how storm event sampling will be triggered in the event that a 20% increase in stream flow rate *does not occur* during the post-snowmelt period.

EPA Response: The text has been revised to indicate that the most appropriate trigger for initiation of storm-even monitoring is not known, and that a value of 100% (a doubling of average flow) will be used as an initial starting value. This value may be revised by EPA either upward or downward, as data are obtained on the actual changes in flow rate in the Rainy Creek drainage that result from storm events.

Section 5.1.5, page 19: Please revise this section to reflect the discussions and decisions made during the Libby OU3 Biological Technical Assistance Group (BTAG) meeting on February 28, 2008. As discussed during the BTAG meeting, the collection of surface water samples from six locations for toxicity testing will be deferred in preference to the performance of a serial dilution study based on dilution of a surface water sample collected from one location. Please modify the text accordingly.

EPA Response: The design of the surface water toxicity testing protocol has been modified to include the selection of one site water based on expedited analytical results obtained from the Libby on-site laboratory in a program coordinated by EPA. This one site water will be tested using a dilution series approach.

"TRV" is not defined in the text or included in the List of Acronyms.

EPA Response: The acronym has been defined.

Section 5.15, page 19: In regard to surface water toxicity testing, the second paragraph states, "In order for the results to be optimally useful, the samples of site media that are tested must include the highest levels of contaminants observed on site." Please clarify that samples of site media that are tested should include the highest levels of contaminants that occur in areas that provide suitable habitat for the assessment endpoints (i.e., receptors of concern). As noted in our comments above, the portion of the tailings impoundment that dries up annually and freezes over in the winter may not provide adequate habitat for resident fish. Therefore, concentrations of LA in this portion of the

tailings impoundment may not reflect actual exposures to fish or other aquatic receptors, if present.

EPA Response: EPA does not agree that the surface water selected for toxicity testing in fish must necessarily be derived from a location that is judged to be "suitable" fish habitat. The most important objective is to obtain a site water that is at the high end of waters that occur on site, and to characterize the dose response relationship. If it is determined that some on-site waters are not suitable habitat (this is not known), that will be considered as part of the risk characterization process.

Section 5.15, page 20: In the first full paragraph on this page, the presupposition is again made that the highest LA concentrations will be coincident with peak snowmelt-derived stream flow. Please provide rationale or references to support this.

EPA Response: The text has been revised to make clear that it is unknown whether or not concentrations will change (increase) during spring runoff, and that the purpose of the investigation is to determine whether or not a change does occur in this interval, and if so, to characterize it.

As discussed during the February 28, 2008 BTAG meeting, Remedium Group and MWH agree that the proposed 'serial dilution' toxicity study will provide useful information for assessing the potential for LA to impact fish within surface waters at the Site. To be maximally useful to the assessment of potential risk to fish inhabiting surface waters within OU3, however, we believe that the concentrations tested should reflect the range of LA concentrations in surface water where fish may be present. This range of LA concentrations appears to be somewhere between 114 MFL in the tailings impoundment to <1 MFL at the confluence of Rainy Creek and the Kootenai River. Thus, we recommend that serial dilutions of LA in surface water should provide good coverage within this concentration range in order to yield the most useful dose-response curve for assessing potential risks to fish inhabiting surface waters at OU3. While spiking surface water samples up to *ten* times (as discussed during the BTAG meeting) this range may provide interesting test results from a research standpoint, they are of questionable relevance to OU3, and may detract from the quality of the dose-response curve that is obtained.

EPA Response: The design of the surface water testing protocol has been revised so that a serial dilution from the high end (perhaps 100 MFL) to a very low concentration will be investigated. Data from Belanger (1985) suggest effects might be observable as low as 0.01 MF. A spiking study will not be contemplated until the results of the Phase IIA study are completed and evaluated.

Section 5.2.1, page 20: A second round of Phase IIA sampling of the Kootenai River is called for "under summer baseflow conditions." As shown on the 2007 hydrograph for the Kootenai River below Libby Dam (http://www.cbr.washington.edu/cgi-bin/dart/makegraph/dart/makegraph/html-src/headwater.config), the flow of the Kootenai River is controlled at the dam. 2007 flow rates at the dam outlet varied from less than

5,000 cubic feet per second (cfs) to over 25,000 cfs, with as much as 10,000 cfs increase or decrease over periods as short as one week. Flow from the dam is regulated according to hydroelectric power generation needs, control of Lake Koocanusa pool height, and fisheries considerations. Given that outflows from Libby Dam are artificially controlled and there is no seasonal or predictable "base flow" period, please be more specific as to when the second Kootenai River sampling event is to occur.

EPA Response: The text has been modified to clarify that this refers to the flow in Rainy Creek, not the Kootenai River.

Section 5.3.6, page 24: In the first sentence, please add an "s" to the word "station" (there are three). Also in the first sentence, it is specified that the continuous flow monitoring stations "will be capable of measuring flows from 1 to 150 cfs." The specified range appears to be at least an order of magnitude too high. The flow rates measured at stations CC-2, LRC-2 and LRC-6 were 0.19, 0.5 and 0.41 cfs, respectively, in October 2007. A standard 6-inch Parshall flume is suitable for measuring stream flows ranging from 0.05 to 3.91 cfs; a 9-inch flume is suitable for a range of flows from 0.09 to 8.86 cfs. Please provide the basis for the specified range of flows.

EPA Response: The flow capacities are based on the predictions from the Schafer report. As noted in the text, it is considered possible that the response of Rainy Creek to a storm event may be larger and more rapid than that predicted by Schafer. The Phase IIA SAP requires that Remedium submit a conceptual design and other details of flow monitoring that will be suitable for measuring flow under both baseline (low flow) conditions, and under high (storm event) conditions.

Section 5.4.3, page 27: In the last sentence of the first paragraph, please change the word "not" to "no."

EPA Response: The text has been revised as recommended.

Section 5.4.4, page 27: In the first sentence of the second paragraph, please change the word "or" to "of." In the second bullet item, please change the word "top" to "to."

EPA Response: The text has been revised as recommended.

Section 5.6, page 29: In the second paragraph, please clarify "Project Manager." If this is the EPA Region 8 **Remedial** Project Manager, please specify so here (and elsewhere in the document), and/or use the acronym "RPM."

EPA Response: The text has been revised as recommended.

Section 6.1.1, page 31: Please insert a space between "until" and "50" in item 2.

EPA Response: The text has been revised as recommended.

Section 6.7, page 34: In the final paragraph of this section, both a "Project Manager" and an "EPA Project Manager" are referenced. Please be specific and consistent in identifying these individuals.

EPA Response: The text has been revised as recommended.

Section 7.1, page 35: The text states that large volume samples of surface water will be collected from five locations for purposes of site-specific toxicity testing. As described in our comments on Section 5.0, the collection of surface water samples from multiple locations for toxicity testing will be deferred in preference to the performance of a serial dilution study based on dilution of a surface water sample collected from one location. Please modify the text accordingly.

EPA Response: The design of the surface water toxicity testing protocol has been modified to include the selection of one site water based on expedited analytical results obtained from the Libby on-site laboratory in a program coordinated by EPA. This one site water will be tested using a dilution series approach.

Section 7.2, page 35: The text states that serial dilutions will represent 100% (undiluted), 50%, 25%, 12%, 6% and 3% of the most toxic water sample. Since toxicity testing of multiple undiluted surface water samples will not be performed as described in Section 7.1, this text should reference serial dilution of the maximum concentration sample collected from the Site. Please also include a 0% sample as a laboratory control sample.

EPA Response: The serial dilution strategy has been revised to include a wider range of dilutions in order to ensure that the dose response curve does extend into a no-effect range. The text has been modified to make clear that 0% is part of the dilution series.

Section 7.3, page 35: In the third sentence of this section it is unclear what is meant by "between years." Please clarify or recast.

EPA Response: The text has been revised as recommended.

The text states that serial dilutions will be performed on 'spiked' samples in order to obtain about 50%, 100%, 200%, 300% and 400% of the highest values measured in the Site waters. During the February 28, 2008 BTAG meeting, information was presented suggesting that LA concentrations as much as an order of magnitude higher than the maximum LA concentrations detected may be used in toxicity testing. As noted in our comments above, the levels tested should provide good coverage of the range of LA concentrations detected in surface water where fish may be present at OU3, in order to yield the most useful dose-response curve for assessing potential risks to fish inhabiting surface waters at OU3. This LA concentration range appears to be somewhere between 114 MFL in the tailings impoundment to <1 MFL at the confluence of Rainy Creek and the Kootenai River.

EPA Response: A spiking study that evaluates effects of concentration values higher than those observed in site waters in the spring of 2008 will not be contemplated unless the results of the serial dilution test of on-site water indicate that no toxicity is observed at any concentration. In this event, a spiking study will be considered as a way to characterize what concentration would be required to cause toxicity. If the level that causes toxicity does not occur on-site, this will be reflected in the risk characterization..

Section 8.1.2, page 38: In the third paragraph, the sentence "There are four types of solid media that will be collected within the mined area – mine waste, roadway materials, coarse tailings, and fine tailings" seems to be derived from the OU3 Phase I SAP. Only one type of solid media (sediment) is specified for collection during Phase IIA.

EPA Response: The text has been revised to delete references to the mine waste types since Phase IIA focuses on surface water and sediment.

Section 8.3.1, page 39: Please use lowercase "p" in the word "Preparation."

EPA Response: The text has been revised as recommended.

Section 9.0, pages 47-48: Registered trademark symbol "®" should follow the product names, not the manufacturer name.

EPA Response: The text has been revised as recommended.

Section 9.3, page 48: It is unclear as to which "Project Manager" is intended. Please specify here and throughout the document.

EPA Response: The text has been revised to clarify that project manager means the EPA Remedial Project Manager.

Section 11.1, page 51: Please provide examples of the "pre-determined, standardized requirements" that will be used to validate the non-asbestos laboratory data.

EPA Response: The text has been edited to provide clarification.

TABLES

Table 5.5: Please revise extraction/analysis holding times for organophosphate pesticides to 7 days/40 days.

EPA Response: The table has been revised as recommended.

Table 8-1: Please revise acceptance criteria for all field blank samples to Non-detect (<PQL) for all target analytes.

EPA Response: EPA has conferred with the analytical laboratory and with the data validators and has determined that the acceptance criteria for blanks (both field blanks and laboratory blanks) should be ½ the PQL. This change has been made throughout Table 8-1.

Table 8-2: Please revise acceptance criteria for SW-8260B, 8270C, 8082, 8081, 8141A, and 8151A to say: "...within laboratory QC acceptance criteria," or provide "Attachment X."

EPA Response: The table has been revised as recommended.

Please revise the method blank acceptance criteria for SW846 8141A to: "< Reporting limit."

EPA Response: EPA has conferred with the analytical laboratory and with the data validators and has determined that the acceptance criteria for blanks (both field blanks and laboratory blanks) should be ½ the PQL. This change has been made throughout Table 8-1.

Please revise LCS corrective action for SW-846 9012B to: "...the affected batch:" Please remove "AFCEE." (MWH made this same comment on tables included in the Phase I SAP; the error was retained in the final version).

EPA Response: The table has been revised as recommended.